

# ATOMIC ENERGY

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Dear Sir:

With the completion of a phase of the expansion program at Hanford Plutonium Works, involving the new plutonium production reactors and associated chemical separation facilities, further air space reservations have been made in the immediate area. Now, the Hanford prohibited area, under this redefinition, has been extended a considerable distance west of its original boundaries.

To prepare for the estimated 150,000 persons who will need medical attention in the event of an atomic bombing of New York City, Dr. Marcus D. Kogel, the City's Commissioner of Hospitals, and Director of Medical Emergency Division of New York City Office of Civil Defense, has sent all voluntary, municipal and proprietary hospitals in New York City a work plan for organizing their resources. Three major steps are suggested: (1) Maximum stockpiling by each hospital of essential medical items and blood which would be needed to care for victims of a bomb attack, (2) Increasing the peacetime maximum number of beds, by buying new equipment and surveying nearby structures which could be used for emergency annexes, (3) Recruiting volunteers and training both regulars and volunteers in their own institutions, in proper procedures, for emergencies.

The U. S. Atomic Energy Commission has now authorized its nine operations offices to apply the Defense Order (DO) ratings of the National Production Authority's Regulation 2, on direct contracts and purchase orders. Cost-plus-fixed-fee contractors, and subcontractors, were also given the right to apply DO ratings on purchases for AEC purposes. Regulation 2 will cover the AEC for contracts and purchase orders which do not exceed: (1) \$34,200,000.00 per quarter, through the calendar year 1951 for operations programs materials, measured in deliveries, and (2) A total of \$825,000,000.00 on construction programs between now and June 30th, 1951, measured in commitments. (Not subject to Regulation 2 are source and fissionable materials.)

A course in "Nuclear Power Reactor Technology", being given by the graduate division of Columbia University's College of Engineering, New York City, will be Columbia's first step in an instructional program emphasizing nuclear power. Scheduled lecture topics, in the new course, are: Heat Transfer; Nuclear Reactor Construction; Power Generation; Metallurgy of Metals in Nuclear Reactors; Health Physics; Nuclear Chemistry and Chemical Physics; Power Resources of the World; Elements of Nuclear Physics; Demonstrations in Nuclear Physics; and Stress Analysis....On the undergraduate level, a curriculum in nuclear engineering is being offered by the State College of Agriculture and Engineering of the University of North Carolina. This 4-year course, presented under the auspices of the physics department, will lead to the degree of bachelor of arts in nuclear engineering. It can be followed by a fifth year of work leading to the professional degree in nuclear engineering.

AT THE ATOMIC CITIES & CENTERS IN THE UNITED STATES...

ARCO, Idaho- For the construction of the two remaining buildings and other facilities for the (land based prototype) submarine thermal reactor which is to be erected here, M. J. Brock and Sons, Los Angeles, have submitted the low bid of \$1,018,000.00. Other bidders were Nomellini Construction Co., Stockton, Calif., who submitted a bid of \$1,025,000.00, and F. H. McGraw and Co., Chicago, with a bid of \$1,085,151.00. Construction of the main building for this reactor has been underway as a result of previous bids of August 9, this year; work is being done by F. H. McGraw and Co. It is a \$1,247,000.00 job. Plans and specifications for this construction were prepared by Rust Engineering Co., Pittsburgh. Prime contractor on this submarine thermal reactor is Westinghouse Electric Co., E. Pittsburgh; hence, design and construction is sub-contracted by them. Meanwhile, both Westinghouse and Argonne National Laboratory, Chicago, are working on the nuclear reactor, in conjunction with the Bureau of Ships (USN), and other agencies studying problems of nuclear propulsion of undersea craft. In the current budget USAEC, the sum of \$26,000,000.00 has been allocated for the project.

The chemical separation plant, at the reactor testing station here, is to be operated by American Cyanamid Co., New York, under terms of a contract negotiated with that firm by the AEC. Twenty-one firms were considered before selection of American Cyanamid, according to an AEC official. Architect-engineering services for the design of the plant are being handled by Foster-Wheeler Corp., New York; Bechtel Corp., San Francisco, are erecting it. Total cost of the plant will be \$8 million; it will provide a means of separating fissionable materials from accompanying fission products, after use in the nuclear reactors here, and make the material available for re-use. Oak Ridge National Laboratory, and Foster-Wheeler, are designing the chemical processes to be used in separation.

BROOKHAVEN NATIONAL LABORATORY, Upton, Long Island- Discussions held here last week by the Society for Pediatric Research have been concerned with standards for protection of children receiving radioactive isotope therapy or otherwise exposed. An effort was made, by the Isotopes Committee of the Society, to standardize safety rules and observation procedures in treatment of children with radioisotopes, as well as consideration of the feasibility of providing a central agency for correlating standard data on radiation effects.

OAK RIDGE, Tennessee- Negotiations are still taking place between the AEC and the Roane-Anderson Co., for the operation of Oak Ridge by the latter. Roane-Anderson, a subsidiary of Turner Construction Co., New York, has a contract for the operation of Oak Ridge for an annual fee of \$180,000.00. This contract with the AEC is due to expire this December 31st. However, a rider in the appropriations bill passed this year by Congress specifies that the fee must not be more than \$90,000.00. Although Roane-Anderson originally indicated that they were not inclined to sign at this figure, they more recently signified that they would be willing.

Declaring that under present AEC operation Oak Ridge will never even approach a semblance of a normal community, a group of Oak Ridge business men have pointed out to the AEC certain steps that might be taken to hasten normalcy. To compete with outside areas, they explained, business firms must have competition among landlords and property locations, if they are to compete in goods, services, and prices. They recommended that private construction be made available, either to individuals or real estate development groups. To permit the economy to expand, rather than shrink as it is now doing, the group said industrial and manufacturing sites should be established at Oak Ridge. Now, they said, business men have the economic liability of complete dependence on the plants. Under present conditions, they noted, with a policy of constant decrease in the number of housing units to be maintained by the AEC here, population is decreasing. They asserted that the bidding system of awarding commercial locations does not consider as of any worth the good will, and other intangibles that may have been built up.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS- An improved version of the World War II "Zeuto", the model 2581 is a battery-powered, non-discriminating rate meter. The detecting ionization chamber is covered with a rubber hydrochloride film on the underside of the instrument, and is capable of detecting 25 Kev beta particles, and 2 Mev alpha particles, as well as gamma and x-radiation. This film is replaceable, and is protected by a removable wire grille. Instrument weight: 7-lbs.; size: 10" x 4 3/4" x 5 3/4" deep. Meter (on top of instrument) reads directly in counts per minute for alpha particles, and in mr/hr for beta and gamma rays; two ranges are provided. --Nuclear Instrument & Chemical Corp., Chicago, Ill.

Van de Graaf machine, Model H, type C. Manufacturer states this 5 million volt positive ion accelerator produces a well collimated and intense beam of charged particles, homogenous and controllable in energy. Constructed for horizontal or vertical installations, in the energy range of 2 million to 5 million volts for specialized or general use. Provides positive ions or neutrons, electrons, or x-rays.--High Voltage Engineering Corp., Cambridge 38, Mass.

The "Ekco Prod" is an audible type portable counter comprising a Geiger-Muller tube, a polarizing battery, special headphone matching transformer, a small resistor, and a pair of headphones, all incorporated in a wand-like prod. Weight: 3 1/4-lbs. May be carried in one hand and used like a probe, or slung from the body. Battery life is between 6 and 9 months.--E. K. Cole, Ltd., Ekco Works, Southend-on-Sea, Essex (England).

PRODUCT DEVELOPMENTS- A high resolution emulsion for autoradiography has been developed by R. W. Berriman, R. H. Herz, and G. W. W. Stevens, at the Research Laboratories of Kodak, Ltd., Weyaldstone, England. It has been designed to give the best possible resolution, combined with reasonable sensitivity. The new material consists of a strippable 10 micron gelatin layer which carries on its upper surface a 4 micron thickness of fine grain "concentrated" emulsion (i.e., as used for nuclear track recording), supported on a glass surface. In use, the composite gelatine layer is stripped off, floated onto a specimen whose autoradiograph is required, and dried down. It is then exposed, processed, and examined, with the emulsion in optical contact with the specimen. The resolving power, which was measured by making autoradiographs from radioactive test charts, gave a value of at least 200 lines/mm.

Addition of small quantities of gold compounds to the regular silver bromide photographic emulsion increases their sensitivity to x-rays by as much as ten times, E. T. Larson of Ansco Research Laboratories, Binghamton, N.Y., told the Photographic Society of America in Baltimore last week. Larson explained that adding the gold compounds favors formation of the latent image at the surface of the emulsion grains, rather than in the interior where it is inaccessible to normal developers.

NEWS & NOTES- Some advantages of scintillation counters (using anthracene, naphthalene, and thallium-activated sodium iodide) were explained by Bernd Ross, of Radiation Counter Laboratories, Chicago, to the National Electronics Conference, recently held in Chicago. Principal advantage of the scintillation counter, over a conventional counter, Mr. Ross explained, is that radiations are more efficiently absorbed in a solid than over a gaseous volume. Such efficiencies may make scintillation counters as much as 25 times as sensitive as the most efficient Geiger counters now available.

This Electronics Conference (above) also saw the Gagetron, a remote indicating device made by Instruments, Inc., Oklahoma, for reading liquid levels. The apparatus utilizes gamma rays from a radium source located within a vessel. As the level of the material within the vessel rises, the mass absorbs more gamma rays, and the change in intensity actuates the indicating mechanism.

The RCA model 5819 head-on multiplier phototube (of use in conjunction with scintillation counters) is now being made nearly five times as sensitive as the original model, Radio Corporation of America has stated. The newly-improved tube, it was said, also has greater cathode-collection efficiency, higher current amplification, and shorter overall length.

IONIZING RADIATION...investigations & notes...

In an effort to determine whether supplementary vitamin B-6 is helpful in combating the after effects of excessive exposure to ionizing radiation, work was done by N. E. Tonhazy, N. G. White, and W. W. Umbreit, of the Merck Institute for Therapeutic Research, Merck & Co., Rahway, N.J. Using a colorimetric method for transaminase, and applying it to mice which had been subjected to radiation, it was found that within the limits of measurement, there was no significant decrease in transaminase activity from that observed in non-irradiated controls.

A study of the effects of roentgen rays on chickens has been made by J. A. Jacquez, and D. A. Karnofsky, of the Sloan-Kettering Institute for Cancer Research, N. Y. They found that acute deaths are produced by roentgen rays in young chicks at dose rates above 10 r/minute, and with total doses of 1,000 r, or higher. The delayed LD-50 dose, in those chicks surviving the acute effects of high dose rates, is about 800 r, and at low dose rates it is about 1,100 - 1200 r. Adult chickens, of both sexes, were found to die acutely at total doses of 1,250-3,000 r, but they often survived a dose of 5,000 r for several days. Chickens surviving the acute effects succumbed within 3-10 days; the LD-50 is in the range of 600 to 800 r.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear energy field...

Manual of Artificial Radioisotope Therapy. Edited by P. F. Hahn, Cancer Research Laboratories, Meharry Medical College, Nashville, Tenn. The salient information necessary for the therapeutic application of radioisotopes. For those with a moderate background of the basic principles involved. Of interest to radiologists, internists, and surgeons desirous of using the new therapeutic techniques. Sections written by specialists with experience in handling radioisotopes in therapeutic quantities. 310 pages. --Academic Press, Inc., New York 10. (\$6.80)

Radioactive Tracers in Biology, by Martin D. Kamen, Mallinckrodt Institute of Radiology, Washington University Medical School, St. Louis, Mo. A second edition of the only text of its kind on tracer methodology as applied to fundamental biological research. 430 pages.--Academic Press, Inc., New York 10, (\$7.50)

An Introduction to Heat Transfer, by M. Fishenden, and O. A. Saunders. For university students of engineering; a guide to relating a large number of practical problems to the fundamental physical principles involved, as the first step toward their solution. 206 pages.--Oxford University Press, London (Eng.) (15s.)

Glossary of Terms in Nuclear Science and Technology. Three sections, of what will be a nine-section glossary, now available. Section III, reactor engineering; 75¢. Section V, chemical engineering; 60¢. Section VI, biophysics and radiobiology; 60¢.--American Soc. of Mech. Eng. 29 W. 39th St., New York 18.

New Atoms, by Otto Hahn, the Nobel Laureate for Chemistry. A collection of publications by the discoverer, in 1938, of atomic fission. Chapters cover (1) Prof. Hahn's Nobel lecture; from natural transmutations of uranium to its artificial fission, (2) Chain reaction of uranium, (3) Artificial new elements, and (4) Personal reminiscences from the history of natural radioactivity. 180 pages. Elsevier Publishing Co., Inc., 215 Fourth Ave., New York 3. (\$1.75)

Penetration of Gamma Radiation Through Thick Targets, by W. R. Faust, U. S. Naval Research Laboratory. Experimental and theoretical investigation of scattering and absorption of gamma rays by thick shields of lead and aluminum. Mimeographed. (\$1.25)....Spectroscopic Properties of Fluorocarbons and Fluorinated Hydrocarbons. Data fundamental in fluorine chemistry; prepared by U. S. Naval Research Laboratory. Mimeographed. (\$4.75)....Radiation Instrument Catalogue. Issued by USAEC. Lists 543 specific items of equipment now commercially available in the U. S., including Geiger counters, ionization chambers, scintillation counters, dosimeters, film badges, etc. (\$2.00)--  
Above three publications from: Office of Technical Services, Wash. 25, D. C.



RAW MATERIALS...radioactive ores & other materials for nuclear work...

UNITED STATES- New Mexico- With the deposits of radioactive ores at Shiprock, N.M., described by the AEC as of some importance, four companies have now shown interest in constructing a carnotite ore processing plant near Shiprock. The radioactive occurrences have been on the reservations of Navajo Indians. At present, a small quantity of ore, produced from a lease near Shiprock, is now being sent to a reduction mill at Monticello, Utah, for treatment.

Nevada- Low grade radioactive minerals have been found in southern Lyon county by a group of California prospectors. Fourteen claims have been filed by them about 37 miles southeast of Yerrington.

Colorado- In South Park, about 70 miles west of Colorado Springs, a finding of radioactive minerals has been reported by W. H. Gaddis, of Hartsel. A shaft has been sunk 40-feet, in the course of the exploratory work.

Idaho-Dredging of monazite sands on Warren creek, below Warren, is to start shortly by Rare Earths, Inc. according to W. H. Hill, consulting engineer for the company. The ground to be worked reportedly will average 60 cents per cubic yard in monazite, zircon, garnets, and gold. Hill stated that output would go to Lindsay Light and Chemical Co., Chicago.

CANADA- At Nisto Mines, Ltd., northern Saskatchewan, samplings from underground workings have shown an average of 0.18% uranium oxide across a width of 2.4 feet, with the last two rounds averaging 0.27% uranium oxide across the same width. The samples were taken from the last 25-feet of the west adit, now 80-feet from the portal.

UNION OF SOUTH AFRICA- In 1949, 346 short tons of beryllium ore containing 10.52% beryllium oxide were produced in the Union. Exports totaled 312 tons, of which the United States was shipped 183 tons, and the United Kingdom 129. Production and sales of beryllium ore during the first quarter of 1950 were 129 and 88 tons respectively. (Export of beryl from the Union of S.A., except under permit of the Atomic Energy Board, is prohibited by an official proclamation.)

FEDERATED MALAY STATES- The possibility that payable deposits of uranium may be found here has prompted the Malayan Geological Survey Department to urge miners to watch for torbernite, radioactive mineral.

ATOMIC PATENT DIGEST...latest U. S. applications & grants...

APPLICATION: Method of preparing nickel nitrate. In the process, 6 to 10 molar nitric acid is flowed through a bed of divided metallic nickel at a temperature between 90 and 105 deg. C., and contact maintained between the acid and the nickel for 10 minutes. The process may be continuous or intermittent. Pat. Application No. 590,431, assigned to the U. S. of America (USAEC).

GRANTS: Production of uranium tri-iodide. Comprises heating uranium metal to a temperature between 500 and 530 deg. C., passing iodine vapor over the hot metal at a relatively low pressure, and passing the vapor mixture through a condensing zone having a temperature gradient decreasing from about 400 deg. C., to about 200 deg. C. U. S. Pat. No. 2,524,584, issued October 3, 1950; assigned to United States Of America (USAEC).

Wide range radiation intensity meter. Comprises connections for applying a direct current potential, a Geiger-Muller counter tube, and a grid controlled electron discharge tube connected in series across the connections. The counter tube is operated in the proportional region, and means are provided for measuring the voltage drop across the grid controlled electron discharge tube, with the voltage drop being a function of the radiation intensity falling on the counter tube. U. S. Pat. No. 2,524,901 issued Oct. 10, 1950; assigned to Westinghouse Electric Corp., E. Pittsburgh, Pa.

Sincerely,

The Staff,  
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